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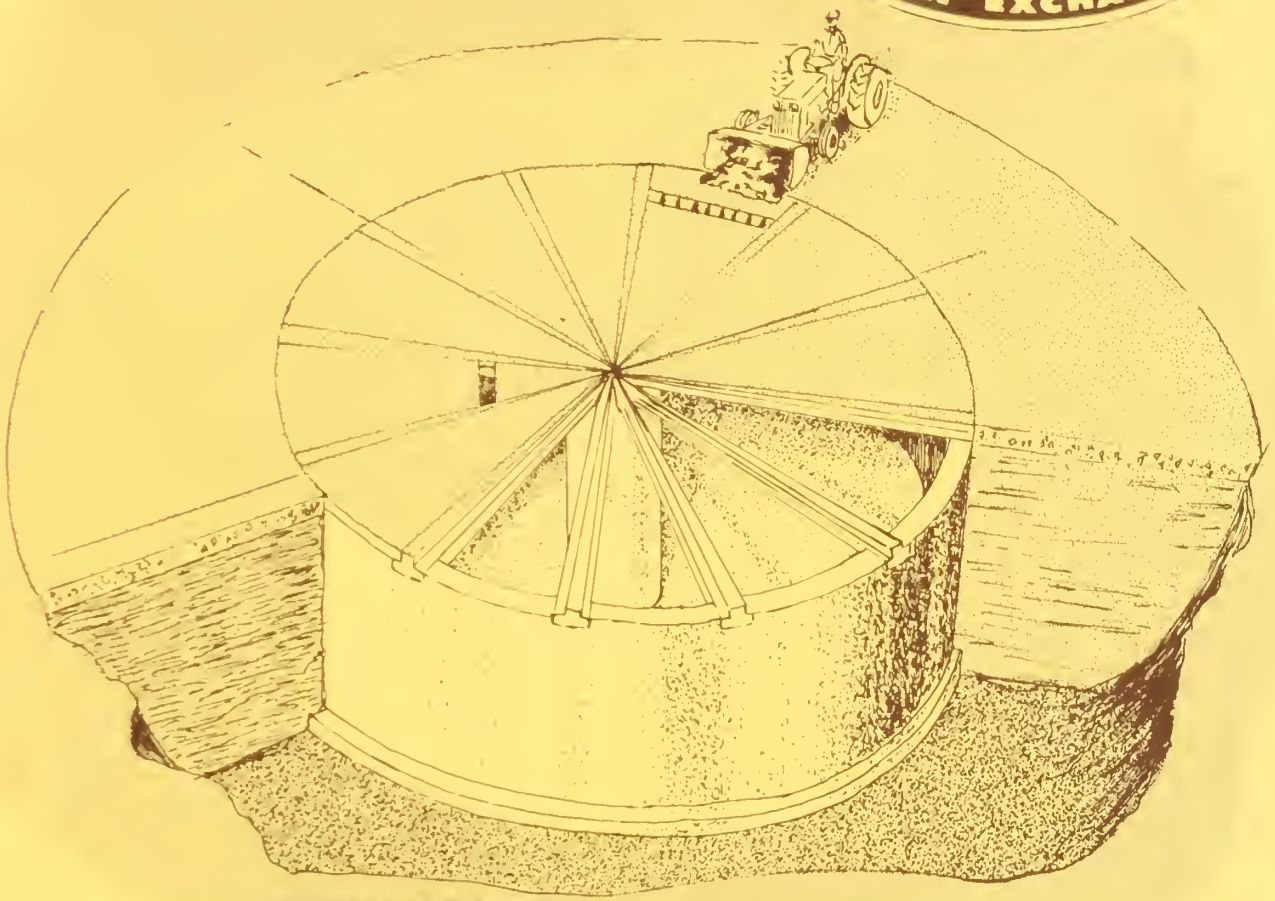
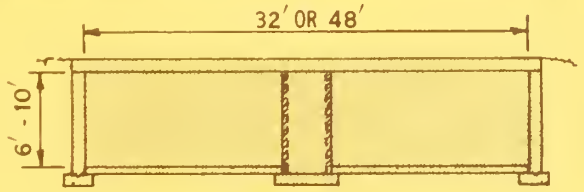
Circular
CONCRETE MANURE TANK

COOPERATIVE FARM BUILDING
Plan No. 5984
(3 - SHEETS)
PLAN EXCHANGE



CUTAWAY PERSPECTIVE



SECTION

This circular concrete tank stores liquid manure until a convenient time for spreading.

Dairy housing systems that use limited quantities of bedding, such as free-stall housing or stanchions floored with mats, are kept clean by flushing or scraping out the manure. When high-pressure water is used for cleaning floors and paved lots, the slurry becomes diluted and can be pumped. Water added in amounts of 10 to 20 percent of the volume of manure will make a slurry that most pumps can handle with little trouble.

This tank may also serve to store slurries from swine or poultry production plants. The semiliquid material can be conveyed to the tank by powered blades, augers, flight conveyors, or water flushing. All of these have been used successfully in different situations.

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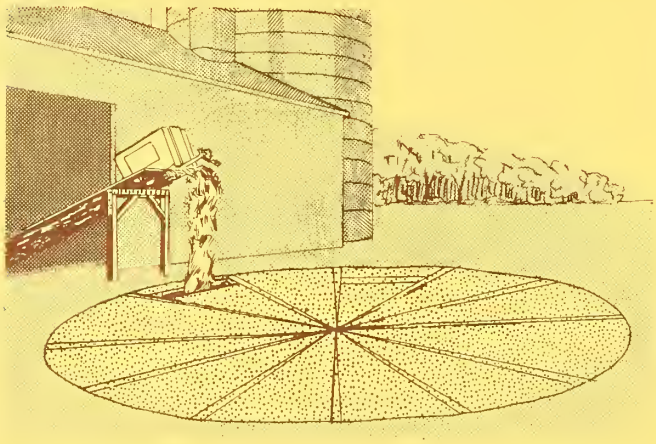
TANK CAPACITY:

To estimate the size of manure tank needed, multiply the length of storage time desired (in days) by the amount of slurry produced each day (in gallons). A reasonable allowance is 15 gallons per day for a cow, 2 gallons per day for a hog, and 0.4 gallon per day for a chicken.



A gutter cleaner dumping directly into the storage tank.

For example, suppose 120 days storage is desired for 70 cows. The tank capacity needed is estimated as follows: 120 x 70 x 15 = 126,000 gallons.

Tank capacities detailed by Plan 5984 are:

Tank Size	Tank Capacity
32 feet in diameter:	
6 feet deep	36,000 gallons
8 feet deep	48,000 gallons
10 feet deep	60,000 gallons
48 feet in diameter:	
6 feet deep	81,000 gallons
8 feet deep	108,000 gallons
10 feet deep	135,000 gallons

A tank 48 feet in diameter and 10 feet deep would be large enough to serve the needs given in the example (for 120 days and 70 cows).

Sometimes a combination of manure spreader and liquid manure tank is used to dispose of wastes. If so, the base daily slurry production figures should be modified to reflect the percentages handled. For example, a holding-pen and milking-room area receives about 10 percent of the daily manure production, but may have considerable volume of flushing water.

STORAGE TIME:

Selection of length of storage time depends partly upon the method of dispersal of the slurry on fields. Suppose the slurry is distributed in irrigation water. A minimum storage time of 7 days is recommended. Fields with crops suitable for receiving the irrigation waters must be maintained within a reasonable delivery distance from the tank. In winter, more storage capacity may be needed because of freezing weather and unsuitable crop growth situations. For irrigation systems, the slurry is often diluted to as much as 100 gallons per cow because delivery of water to crops is desired and well-diluted slurry pumps more easily than thick slurry.

If liquids are distributed by tank trailers or trucks, field conditions often control storage time. Heavy trailers may compact or puddle soils that are too wet. Rainfall, temperature, soil type, and cropping systems also enter into judgment of field conditions that may dictate storage time.

Another consideration is the surrounding land use. Pollution of streams and air must be avoided, especially if the pollution would affect neighboring property.

AGITATION:

Agitation is essential for maintaining slurry. Daily agitation that occurs while materials are being delivered to the tank is desirable. A 2- to 3-horsepower electrical motor operated by a time clock is used for scheduled agitation. When slurry is agitated only at time of cleaning, a 30- to 40-horsepower takeoff from a tractor is usually used to drive the agitator.

Agitation may be hydraulic (circulation of the slurry through a pump to a series of three jetting nozzles to give a swirl in the circular tank) or may be mechanical (rotating paddles). Hydraulic agitation is recommended for a circular tank.

Complete working drawings may be obtained through your county agricultural agent or from the extension agricultural engineer at most State agricultural colleges. There is usually a small charge.

ORDER PLAN NO. 5984,
CIRCULAR CONCRETE MANURE TANK

If the working drawings are not available in your State, write to the U.S. Department of Agriculture, Agricultural Engineering Research Division, Plant Industry Station, Beltsville, Md., 20705. The U.S. Department of Agriculture does not distribute drawings, but will forward your request to a State that does.

Please use your zip code when you order drawings.

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